FILM BADGE FOGGING IN AUTOMOBILES DURING THE SUMMER

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Occasionally at Fermilab a film badge reading will show a high exposure when the wearer was not in a high radiation area or even, in the case of a construction worker, in any radiation area. One cause of spurious exposure readings is a combination of high temperature and humidity; this combination will allow moisture to penetrate the film packet and cause fogging of the film, mimicing a high-energy gamma exposure.

This note gives the results from a study conducted during the summer of 1980. Film badges were left on the dash boards of two automobiles. The vehicles were operated in a routine fashion, and during the day when they were parked the windows were kept closed. Temperatures inside the cars were usually 20-30^{o} F higher than the official Chicago high temperature. During the three months of the project there were 20 days where the temperatures at O'Hare were over 90^{o}F, resulting in car temperatures of 125^{o}F.

Each vehicle had 12 badges, four of which were removed each month. The averages for each month are shown in Table I. Both sets of badges showed an increase in film fogging over time; no explanation is hypothesized for the difference between the two vehicles.

TABLE I.

Average reported exposures for films left on automobile dashboards during June, July and August, 1980. Exposure reported in millirem. Uncertainties represent one standard deviation.

EXPOSURE PERIOD MONTHS	VEHICLE 1	VEHICLE 2
1	118 ± 56	575 ± 310
2	755 ± 156	57,538 ± 42,237
3	4,830 ± 8528	116,180 ± 7,471